217c Effects of Particle Concentration on Efficiency of Chemical Mechanical Planarization

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Process of chemical mechanical planarization CMP) is widely used in applications ranging from glass polishing to semiconductor device manufacturing. The technology is an enabler for building damascene copper interconnects used in high end CMOS based electronic devices. During a CMP process a chemically active slurry containing nanometer size particles is applied to the polished surface. The process relies on combination of chemical and mechanical surface interactions to provide nanometer scale flatness across macroscopic (200-300 mm) surfaces. Usually removal rate of a CMP process is described by the Preston law that postulates linear dependency of the removal rate on the product of the polishing pressure and surface relative velocity. In this presentation dependency of the Preston constant on the slurry particle concentration will be discussed.